SYNCHROTRON-BASED HIGH RESOLUTION FAR INFRARED SPECTROSCOPY OF BENZALDEHYDE

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The rotationally-resolved vibrational spectra of benzaldehyde have been recorded in the far infrared region at room temperature using the Bruker IFS125 Fourier Transform spectrometer at the Canadian Light Source with a resolution of 0.000959 cm^{-1}. The lowest frequency vibrational bands collected correspond to the fundamental and hotbands of the -CHO torsion at 110 cm^{-1}. The assignment and analysis of the dense spectral features in this region will be detailed. In addition, the newly obtained band origin of the -CHO torsional fundamental will be compared to *ab initio* results in relation to the discrepancy[a] between theoretical and experimental values of the potential barrier to internal rotation in this molecule.

[a]L.D. Speakman, B.N. Papas, H. Lee Woodcock, H.F. Schaefer III, *J. Chem. Phys*, **2004**, 120, 4247-4250; I.A. Godunov, V.A. Bataev, A. V. Abramenkov, V.I. Pupyshev, *J. Phys. Chem.A*, **2014**, 118, 10159-10165, and references therein